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Inhibition Plcγ2 and Hydrophobic Acids Synthesis cause Osteoarthritis, Diabetes and C-lymphocytic Leukemia Diseases Where Normally PLCs can Recover Interferons Synthesis

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Abstract

Proper S6K regulate BTK pathways which regulate PLCγ2 synthesis which are main regulations for thromboxane-A "TXA2" synthesis, and necessary for B-cell maturations and T-cells modulations and functions.

Deficiency in Ser amino acids and in hydrophobic amino acids are reflect decreasing in synthase enzyme lead to deficiency in BTK function and deficiency in PLCγ2 that lead increasing in colony stimulating Factor-1 "CSF-1 where PLCγ1 specified to circuit to CSF-1 which upon synthase effect will promote PLCγ2 synthesis which necessary for activating BCRs for activating both IgM and IgD antigen for B-cells maturation and activities, for T-cells modulations, and for TXA2 synthesis.

Proper Akt, S6K1 synthesis, OPA1 enzymes and fatty Acyl-COAs are necessary for regulating RORs isoforms Biosynthesis which regulate both IFNs and PLCs synthesis {Where both IFNs and PLCs are covering each other (IFNs <->PLCs) } that PLCγ1 promote the PLCγ2 synthesis upon BTK regulations.

Osteoarthritis "OA" is characterized by a sharp expression in Gamma-Phospholipase C-1 "PLCγ1", with decreasing "or inhibition" in PLCγ2 which reflect decreasing in synthase functions and in IFN-beta synthesis that reflect decreasing or deficiency in TXA2 Biosynthesis.

The increasing in PLCγ1 with Deficiency in Ser amino acids will lead to deficiency in Ser phosphorylation signaling and deficiency in the pyrimidine kinases (PST-thymine and PS T-Cytosine kinases) synthesis, that lead to decreasing in synthase activity which will reflect down regulations in BTK pathways and inhibition in PLCγ2 productions which will reflect diabetes (production of Androgen instead of estrogen), and can reflect Osteoarthritis "OA" prognosis which depend on the percentage of Deficiency or inhibition in basic amino acids and their basic necessary signaling pathways.

T2DM is strongly connected with OA diseases and are linked together by the deficiency in Ser amino acids and their phosphorylation, and any early decreasing in Ser and in hydroponic acids synthesis can lead to both and more disease. Pathogenic type 2 diabetes associated with progressive beta-cell impairment due to the mutations in the production of S6K1 (deficiency in Ser "TCT, TCC,TCA"), and inhibition in the PLCγ2 which due to inhibition or decreasing in Synthase and lead to deficiency in BCR activities. The decreasing in PS/T-Thymine Kinases and PS/T-Cytosine kinases chains (mTORC1) due to deficiency in Ser amino acids (where normally those pyrimidine kinases are produced from the phosphorylation process on Ser amino acids) will lead to mutated S6K and Akt productions and decreasing or mutations in ATPase and GTPase which lead to decreasing in OPA1 repair and lead to synthesis of Androgen instead of Estrogen which are depending on the availability of hydrophobic amino acids synthesis including Ser and Tyr amino acids.

The effect of Synthetase enzymes on biological molecules is for creating active gamma-subunits "PLCγ1" that can be modified by synthase effect for Betasubunit synthesis "PLCγ2" then will be modified by phospholipase effects for alpha subunits productions. The releasing of pyrimidine kinases "PS/T-Thymine -Kinase and PS/T-Cytosine -kinase chains (mTORC1)" are so necessary steps for proper S6K productions and for proper fatty Acyl-COAs synthesis (long fatty Acyl-COA) which are so important for regulating RORs Biosynthesis and necessary for both IFNs and for PLCs productions which started by the productions of PLC-gamma and IFN gamma, where both PLCγ1 and IFN-Gamma are necessary for regulating proper PLCγ2 biosynthesis upon "BTK activity" then PLCγ2 are necessary for regulating BCR functions which imp for regulating both IgM and IgD activities for B-cell maturations, for adjusting anti-inflammatory processes and for T-cells modulations, then PLCγ2 is so necessary for thromboxane-A synthesis, and for bone growth and immune modulations.

Deficiency in conversion of glutarate to glutamate and decreasing in Proline (hydroponic acids) biosynthesis can affect on Cartilage synthesis and bone growth due to decreasing in stimulating mitochondrial OPA1 oxidations.

Protein tyrosine phosphatase (PTP) gamma (carry-ve charge regulated firstly by synthetase gamma-oxidations) has been proposed to be an important regulator for chondrogenic patterning, where PTPs are critical regulators of tyrosine phosphorylation that it's activity depends on the Tyr, and Ser synthesis (during hydrophobic acids synthesis) and on JAK state signaling activities.

And so, the proline-rich tyrosine kinases regulate proper PLCs isoforms which compete for binding site at the very C terminus of fibroblast growth factor for osteogenitor embryonic development, and bone growth.

Synthetase enzyme is the main regulator for PLC γ 1 functions followed by synthase effects for active beta-subunits "PLC γ 2" productions which can be able to "upregulate phospholipase activity" for alpha subunits (PLC-alpha) productions (alpha oxidations), for reactivating fibroblast growth factor receptor (FGFR2), for reactivating both IgM and IgD, and for TLR4 productions for osteoblast processes.

PLC γ 1 can competes for a binding site at the very C terminus of FGFR2 for embryonic development and for bones growth, followed by synthase effect for PLC γ 2 and for IFN-beta synthesis where both are necessary for activating BCR functions for B-cells maturation and for TXA2 synthesis. PLC γ 1 recruited to CSF-1 for two pathways activities 1st / re-activating IFNs productions which regulate MHC class1 and class-two for modulating cell-surface antigen protein functions, 2nd / re-activating PLC γ 2 for modulating T-cells activities, where PLC γ 1. Involved in the production of TRIM22 for mediating antiviral activities and anti-inflammatory processes through reactivating IFNs productions for PLC γ 2 synthesis. PLC γ 2 are so imp in anti-inflammatory processes (regulated by BTK functions) for thromboxane-A synthesis.

Inhibitions or mutations in S6K, in BTK and then in PLC γ 2 productions will cause an inherent or inhibition in CXCL12 then followed by inherent or inhibition in CXCR4 then reflect inherent or inhibition in the regulation of B-cell growth through mutations in IgM and in IgD. Proline amino acids are necessary for reactivate OPA1 anabolic oxidations started by activating synthetase for producing gamma-subunits "PLC γ 1", then modulated by synthase effect for beta "PLC γ 2" synthesis, and then modulated by phospholipase alpha oxidations for alpha-subunits "PLC-alpha" synthesis respectively for cartilage synthesis, for bone growth including antigen modulations (both IgM and IgD) and reactivation, and then for thromboxane-A synthesis.

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PTPs: Colony-stimulating Factor-1 "CSF-1" inositol-1,4,5-triphosphate (IP3) and Diacylglycerol thromboxane-A "TXA2" CXCR4, CXCL12 pathogenic chronic lymphocytic leukemia (CLL) tissue cells B cells and B cells receptors "BCR" osteoprogenitor pathway Fibroblast growth factor receptor 2 "FGFR2" interferon regulatory factors (IRFs) antigen-specific immunoglobulin IgM and IgD.

Porpoise of Study

Understanding that the inhibition or mutation in S6K and in hydrophobic acids (Ser, Tyr, Pro...), in BTK and PLC γ 1 will lead to inhibition in PLC γ 2 and in Thromboxane-A 2 then will be the main reasons for chronic lymphocytic leukemia "CLL" disease and some other serious diseases, where proper S6K /BTK and PLC γ 2 are main regulations for thromboxane-A synthesis and necessary for B-cells maturations and T-cells modulations.

Also, it's important to Understand main factors that cause and link the Osteoarthritis "OA" with diabetes which are deficiency in Ser (hydrophobic) amino acids and the mutated S6K productions which lead to deficiency or inhibition in Ser phosphorylation signaling which normally is the basis of Ser/Thr phosphorylation signalling which necessarily for Akt, for S6K1 synthesis and necessary for RORs and IFNs synthesis, and also necessary for proper PLC γ 2 productions, where S6K is the main regulator for ATPase, for ribosomes, for OPA1 repair, and for proper PLC γ 2 synthesis, that I have to note that the percentage of the shortages ratio of amino acids or in the increasing in positive linkages are the main ratio that can define the degree and type of specific disease which can differ from other diseases or can linked with the same Syndromes of other diseases., That also the shortage ratio between the beta Cytokines productions and the ratio of sudden high inflammations productions

"and the type of its inflammatory molecules" have to be calculated and considered related to the patients ages (whether child, youth or old ages) and the duration of the chronic disease disease, that some can be confused to differentiate between autoimmune disease and regular disease problems diagnosis.

That, there was a case of a child with 9-year-old who had a suspicion of loose of bone maturation and growth, and has a sudden infection in the right lung and a lack of breathing with pain. It was found that there was an pulmonary abscesses in right lung, and there was a development with the appearance of an air bag or "inflammatory fluid bag" surrounding respiratory cells in right side. The occurrence of sudden inflammations molecules and their growth was rapid enough faster than IFNs productions and faster than PLC γ 2 productions due to the age of the child, "Note": some her regular treating doctors diagnosed her medical conditions as a type Autoimmune disease and she has weakened immunity due to sudden fast infection related to her young age".

Highlights: Bruton tyrosine kinase (Btk) necessary for activating PLC γ 2, 11, 12 which necessary to activating thromboxane A2 synthesis, And necessary for modulating immune activities and T-cells.

Both Collagen and BTK functions are necessary for regulating and re-activating PLC γ 2 which catalyzes arachidonic acid (AA) to produce thromboxane-A2 (TXA2) synthesis, and the PLC γ 2 are necessary and critical for B-cell receptor (BCR), where, inhibition in BTK and in PLC γ 2 will reflect diabetes, Osteoarthritis, and the Chronic lymphocytic leukemia "CLL". proper healthy PLC γ 2 are so necessary for increasing re-medulate immune efficiencies, and for re-modulate IgM and IgD antigen and T-cells functions, and also proper healthy PLC γ 2 productions (which depend on PLC γ 1 and BTK Biosynthesis) are so important for treating and recovering osteoporosis and both Osteoarthritis and diabetes. Inhibition in PLC γ 2 BioSynthesis can reflect decreasing or inhibition in Thromboxane-A 2 synthesis that can lead to CLL diseases, where, CLL characterized by inhibition in BTK which regulate PLC γ 2 synthesis in bones tissue near knee which the only responsible for TXA2 synthesis (not VEGF nor Tropomyocin where both can activate only white plasma which characterized CLL diseases with

inhibition in TXA₂ synthesis). Chronic lymphocytic leukemia (CLL) observed during treatment with B-cell receptor inhibitors pathway including inhibitor of Bruton's tyrosine kinase-PLC γ 2, where, CLL can be strongly linked to Osteoporosis "OA", and Linked to both Osteoarthritis and diabetes too.

Introduction

Osteoarthritis is characterized by a sharp expression in Phospholipase C gamma -1 "PLC γ 1", with decreasing in PLC γ 2 (which described as PLC beta) productions where PLC γ 1 can be improved by more phospholipase oxidative processes for producing PLC γ 2 and PLC-alpha (in availability of necessary Ser, Tyr, and imp hydrophobic amino acids), where both Plc γ 2 and PLC alpha are necessary for cellular proliferations, bone growth and calcium entry. Where, it has been reported that PLC γ 1 was highly expressed in human OA chondrocytes which are implicated processes including mitogenesis and calcium entry [1].

Phospholipase C isoforms (PLCs) are essential mediators for cellular signaling and for cellular metabolism . PLCs regulates multiple cellular processes including proliferations and biological bones growth by generating bioactive molecules such as inositol1,4,5-triphosphate (IP3) and diacylglycerol.

That, PLC γ 1 basis of inhibition-driven autophagy of IL-1 β -treated chondrocyte confers cartilage protection against osteoarthritis. PLC γ 1 has the roles of analyzing biological molecules "identity as Osteoclast" through expressing its own functions , while PLC γ 2 has the role of functioning PLC γ 1 (through running beta-oxidations which regulated by synthase) for promoting both anti-inflammatory processes and for promoting proliferations through activating PLC-alpha (upon more phospholipase effects on Plc γ 2) for proliferation and growth.

The slightly inhibition or decreasing in PLC γ 1 will decrease osteoclast by decreasing analyzing process that will give priority for PLC γ 2 synthesis "PLC-beta" (that regulated by synthase enzyme) for activating anti-inflammatory processes, and for promoting PLC-alpha production for proliferations functions.

Notice that the increasing in PLC γ 2 synthesis which regulated by BTK will activate osteoblast processes , bone growth , cellular proliferation, and T-cells modulations". The availability of Proline amino acids are so necessary for stimulating and accelerating OPA1 oxidative processes which will activate cartilages synthesis

through PLC γ 2 synthesis , where the availability of hydrophobic amino acids synthesis "eg :Tyr, Leu, Pro, Gly, Ser, ... etc" in vivo are so important for creating gamma subunits synthesis upon synthetase effects [2].

Proline amino acids with necessary hydrophobic amino acids are necessary for accelerating proper OPA1 oxidative processes which promote and activate necessary anabolic processes for cartilage synthesis through activating BTK pathways which regulate PLC γ 2 synthesis for bone growth, and for modulating immune effectiveness.

The Deficiency in the conversion of glutarate to glutamate and decreasing in proline biosynthesis strongly affect cartilage synthesis due to decreasing in the activation of mitochondrial OPA1 oxidative processes.

Deficiency in the mitochondrial OPA1 membrane repairs can reflect deficiency in the proper S6K productions (which necessary for ATP and GTPase synthesis and necessary for OPA1 repair) , that will lead to decreasing in PLCs synthesis (decreasing in PLC γ 2) then in SIRP α 1, and in TLR4 biosynthesis, and can reflect increasing in catabolic analyzing processes (due to increasing in ATPase which depend on purines kinases production from Thr phosphorylation (PSTG-kinases and PSTA-kinases) [3].

The decreasing in PS/T-Thymine kinases and in PS/T-Cytosine kinases (pyrimidine kinases) productions due to decreasing in Ser and in hydrophobic amino acids synthesis (including Proline and Tyr amino acids) will lead to androgen production instead of estrogen (diabetes disease) , where the synthetase activities in diabetic diseases can be increased till will analyze phospholipids , foreign molecules and biological molecules (with decreasing or inhibition in pyrimidine kinases) lead to decreasing in the synthesis of anti-inflammatory processes.

Proper S6K1 synthesis promote ATPase and GTPase productions for OPA1 repair, for activating RORs pathways, for activating BTK pathways and for PLC γ 2 productions, where all are depending on the purines and pyrimidine kinases productions through mTOR Ser/Thr phosphorylation pathways where necessary pyrimidine kinases are necessary for activating BTK and then for PLCs productions, for IFN synthesis, for proper MHCs synthesis, and for proper bone growth with T-cells modulations.

Figures of this Research Work

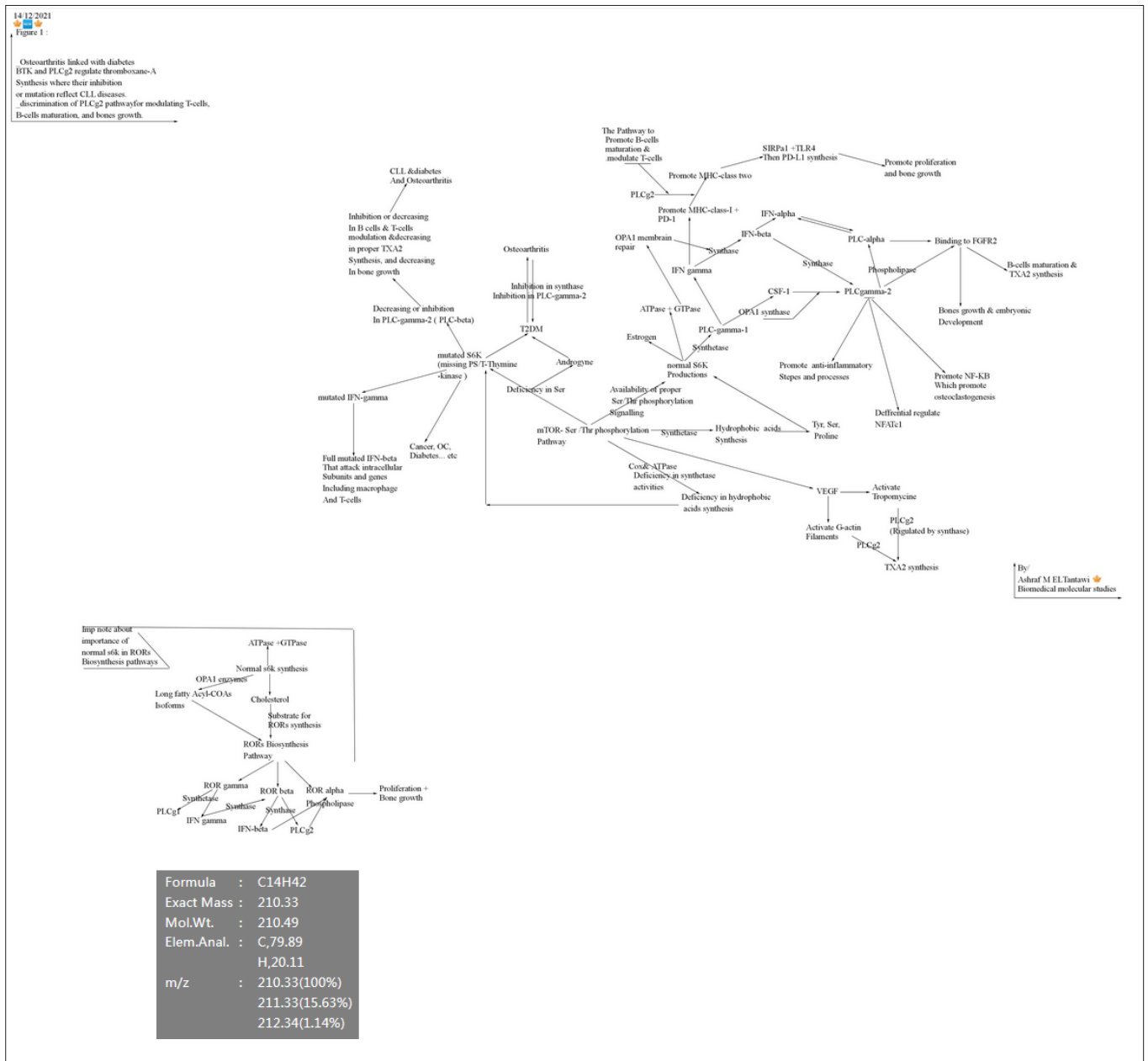


Figure 1

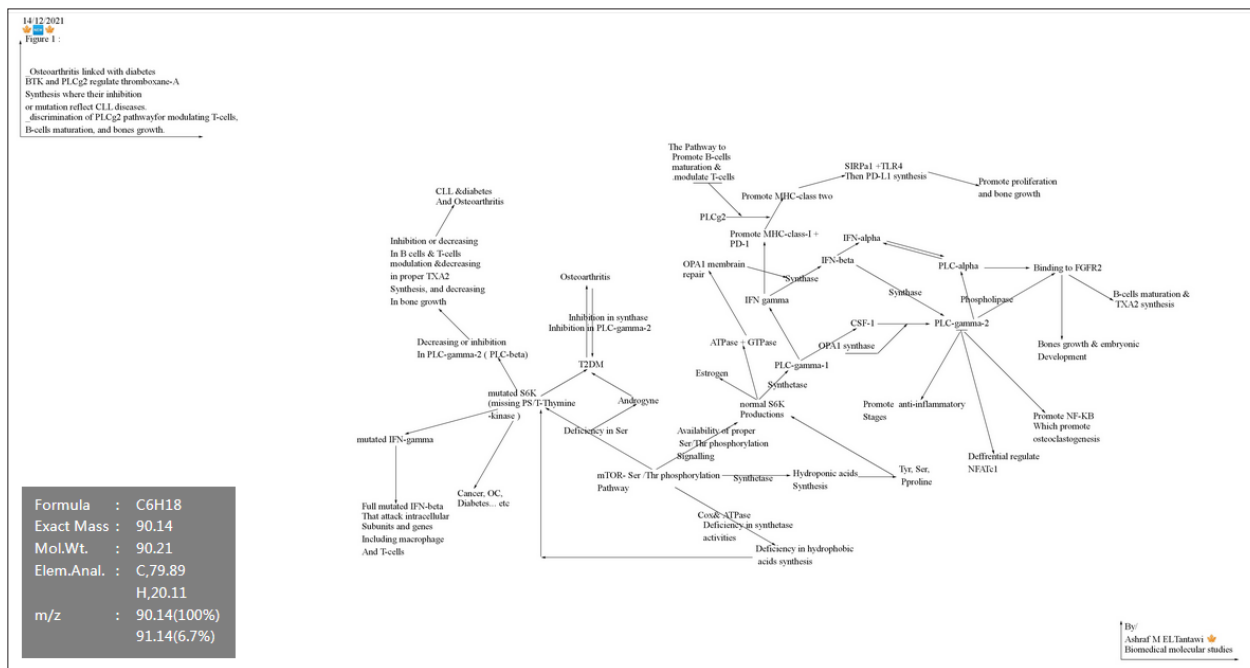


Figure 2

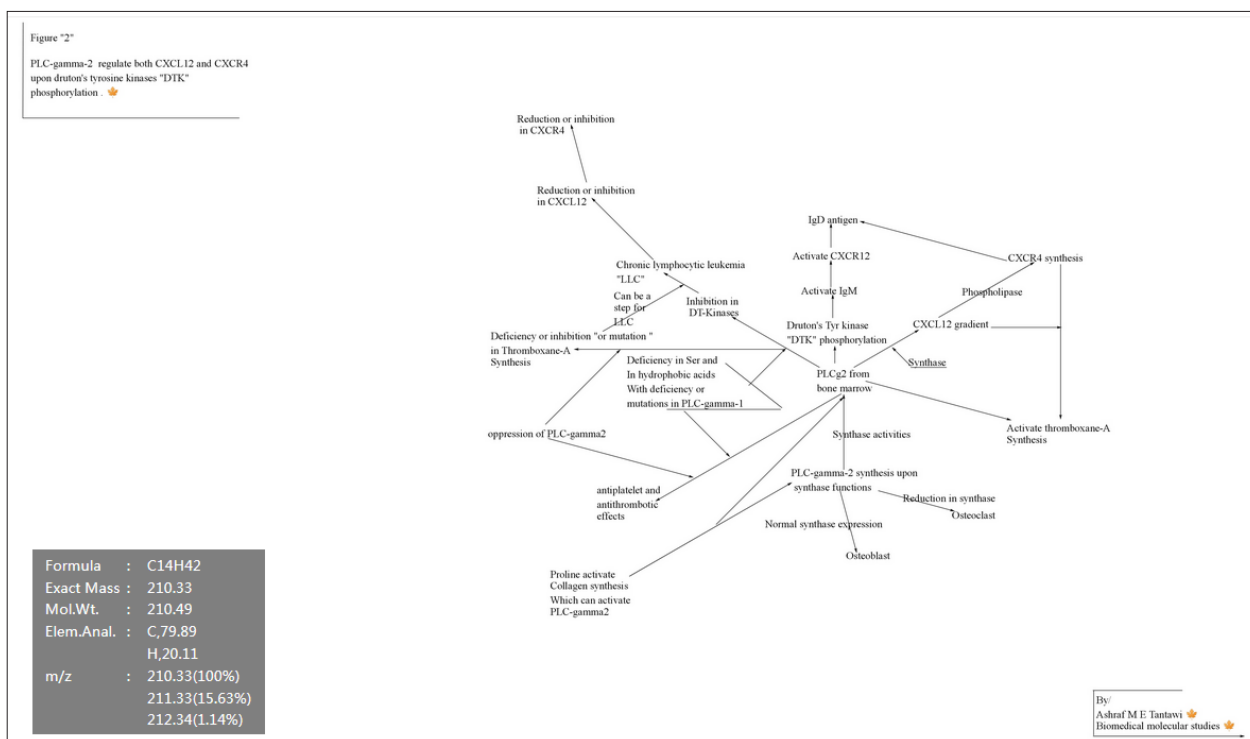


Figure 3

Method and Result

Proper S6K /BTK are so necessary for regulating PLCγ2 synthesis and are regulating proper thromboxane-A synthesis, B-cell maturation and T-cells modulations. Where, it's so important to Understand the main reasons that cause Osteoarthritis "OA" and diabetic diseases which are the deficiency of Ser amino acids and necessary hydrophobic acids (including Proline) which lead to mutated S6K productions due to deficiency or inhibitions in Ser phosphorylation which normally is the basis of mTOR Ser / Thr phosphorylation that are necessary for proper Akt, and S6K1 synthesis and then necessary for RORs and IFNs synthesis and also necessary for proper PLCγ2 productions.

Proper S6K productions through availability of Ser and Tyr amino acids are main regulator for ATPase synthesis and GTPase, where GTPase necessary for OPA1 repair, and then for BTK pathways (which depends on Tyr amino acids and on synthase effect for activating PLCγ2) and for proper PLCγ1 synthesis which regulate PLCγ2 synthesis for necessary bone growth and cartilage synthesis.

Osteoarthritis "OA" is characterized by a sharp expression in Gamma-Phospholipase C-1 "PLCγ1", with decreasing "or inhibition" in BTK which lead to decreasing or inhibition in PLCγ2 "PLC beta" production that lead to decreasing in beta-cells maturation, decreasing in cellular proliferation, and decreasing in T-cells modulations.

The increasing in PLCγ1 with Deficiency in Ser, Proline, and Tyr will lead to mutated S6K productions (followed by mutation in fatty Acyl-COAs production), and lead to decreasing in proper synthase activity and decreasing in BTK processes that will be the result of inhibition in PLCγ2 synthesis, and will reflect deficiency in Estrogen synthesis and increasing Androgen synthesis that will give Symptoms of diabetes and Osteoarthritis "OA" diseases. We'll discuss why both diseases are connected and are caused due to deficiency in Ser and in the synthesis of imp hydrophobic amino acids "as Tyr, Leu, and Proline", that availability of the Tyr and other hydrophobic amino acids are necessary for BTK pathway, that hydrophobic amino acids synthesis regulated by synthetase enzymes.

Deficiency S6K synthesis, and in Ser, Proline, and in Tyrosine kinases "which regulated firstly by synthetase" will lead to increasing in PLCγ1 with decreasing in PLCγ2 synthesis (which Regulated by availability "pyrimidine kinases") that will lead to Androgen synthesis instead of Estrogen which is Symptoms of "diabetes" and Osteoarthritis "OA" diseases.

PLCγ1 is a protein molecules that it's activity depending on Tyr phosphatase, and gamma common receptors synthesis which regulated by JAK STAT signaling, and also regulated mainly by synthetase enzyme, where synthetase is the main second enzyme in OPA1 chains after COX enzyme (followed by synthase and phospholipase respectively) and necessary for hydrophobic acids synthesis), that also synthetase enzymes is so necessary for creating signals transmission which can reactivate mTOR Ser/ Thr signaling pathway for re-producing the active gamma-subunits which regulated by JAK signaling will produce their necessary active receptors for activating gamma subunits "PLCγ1" for beta-subunits "PLCγ2" synthesis (upon synthase effect), then will produce alpha subunits "PLC-alpha" upon more phospholipase effects for activating proliferations, and bones growth.

The PLCγ1/PLCγ2 double-deficient B cell progenitors have

showed reduction in expression of genes related to B cell lineage, IL-7 signaling, and cell cycle. That the activities of both PLCγ1&2 are linked to each other and are so necessary for re-activating B-cells maturation, where, PLCγ2 regulate the productions of both antigen-specific immunoglobulin necessary IgM and IgD synthesis necessary for anti-inflammatory processes, and necessary for T-cells modulations, therefore the deficiency or mutations in PLCγ2 will lead to decreasing in or lead to Malignant transformation in B cells that can cause mutations or inhibition in IgM and in IgD synthesis and will lead to inhibition or mutations in TXA2 synthesis too that can lead to a cancer problem as in chronic lymphocytic leukemia (CLL) disease and can cause several other pathogenic problems as diabetes and OA diseases [4].

B-cells are firstly promoted by the productions of PLCγ1 which upon BTK which regulate PLCγ2 synthesis, that PLCγ1 depend mainly on proper S6K synthesis "that deficiency in Ser amino acids will reflect decreasing in the productions of the two types of pyrimidine kinases (PSTT-K and PSTC-k) that will lead to inhibition or mutations in S6K synthesis", and lead to decreasing in Estrogen synthesis with increasing in Androgen synthesis which lead to pathogenic diabetes diseases [5].

Proper S6K, Estrogen, and PLCγ2 synthesis are depending firstly on the availability of Ser amino acids and on the production of the two pyrimidine kinases (PST-Thymine Kinase and PS T-Cytosine kinase) productions that those both kinases are so necessary for reactivating proper JAK signaling and then for reactivating the BTK pathways, and also necessary for reactivating the ribosomal ATPase which are necessary for repairing the mitochondrial OPA1 membrane (through promoting GTPase productions), where proper OPA1 and BTK are mainly so necessary for "PLCγ2" synthesis "upon synthase regulations effect" for B-cell receptor synthesis, for B-cells maturation, and then for increasing anti-inflammatory processes, then followed by creating PLC-alpha synthesis upon more upregulation of phospholipase functions for promoting proliferations and bone growth through SIRPa and TLR4 productions (I would like to clarify that the more phospholipase upregulation are depending on the percentage of the availability of Proline, Ser, Tyr and necessary Other imp amino acids as Leu which is so important for activating liver cells for sestrins SESNs synthesis for running immune functions including brain).

In case of deficiency the mTOR Ser/Thr phosphorylations signalling due to deficiency in Ser phosphorylations and in Tyr kinases will lead to mutated S6K, deficiency in BTK activities, and will lead to deficiency in synthase functions "which depend on availability of Tyr Ser, Proline Leu... etc" that will lead to deficiency in PLCγ2 synthesis and will lead to Androgen productions with deficiency in Estrogen synthesis which will give the symptoms of diabetes and Osteoporosis pathogenic diseases (and some other serious diseases), and also the deficiency in PLCγ2 will lead to deficiency in TXA2 synthesis that can lead to blood Cancer "CLL" diseases.

Pathogenic type 2 diabetes associated with progressive beta-cell impairment due to deficiency in Ser and Tyr kinases synthesis that will lead to deficiency in BTK functions and inhibitions or decreasing in PLCγ2 productions.

The availability of Ser, Proline, Tyr, and necessary hydrophobic acids are necessary for re-activating BTK which necessary for promoting PLCγ2 productions which is necessary for both B-cell maturation and for thromboxane-A2 "TXA2" synthesis, and also for bone growth [6].

The inhibition in active beta subunits productions “PLC γ 2” can be the reason of decreasing in the hyperpolarization and then electrical migration that will lead to decreasing in the abolition of Ca⁺ which will lead to decreasing in blood pressure and can be the result of Ca⁺ precipitations in blood vessels.

Also, the deficiency in Tyrosine amino acids will prevent the production of tyrosine phosphatase which needed for the synthesis of phospholipase C2 (PLC γ 2) that promote cellular proliferation including TXA₂ synthesis, so the reduction and deficiency in Tyr amino acids “hydrophobic acids” will reduce or inhibit Drutons tyrosine kinases “DTK” followed by reduction in PLC γ 2 synthesis.

Now it is important to consider that proper S6K and Tyr kinases are the main regulator for PLC γ 2 synthesis, and it has been reported that the phospholipase C γ 2 (PLC γ 2) is activated from a variety of cell surface receptors such as Syk “S6K”, and BTK which phosphorylate and activate PLC γ 2 [6].

Proper S6K1 synthesis is the basis for ATPase and GTPase synthesis and also is the basis for ribosome repair where, GTPase is necessary for G-protein synthesis, for OPA1 membrane repair, and for ribosomal repairs that always necessary for regulating cellular growth and anti-inflammatory Processes. As GTPase is a regulator tool for BH4 and NO₃ productions for synthase repair and activity, As S6K1 is so necessary for proper fatty Acyl-COAs synthesis and for PLC γ 1 synthesis and then for PLC γ 2 synthesis “upon synthase effects” which later will regulate the beta-cells maturation and survival upon the productions of firstly CXCL12 then CXCR4 productions.

Also, it has been approved that T2DM is connected with OA diseases, where T2DM has a pathogenic effect on OA through 2 major pathways involving oxidative stress and low-grade chronic inflammation resulting from chronic hyperglycemia and insulin resistance.

Pathogenic type 2 diabetes associated with progressive beta-cell impairment due to the not normal production of insulin which due to deficiency of Ser phosphorylation and other necessary amino acids (mainly Ser, Tyr, Leu, Pro a.a.) that will lead to decreasing “or mutation” in the S6K productions, and will lead to Androgen production instead of Estrogen, and will lead to decreasing or inhibition in RORs synthesis (that will lead to accumulations of cholesterol where cholesterol is the main substrates for Estrogen synthesis regulated by ROR anabolic pathways), that will lead to high ATPase productions (due to availability of purines with decreasing in pyrimidine synthesis) with deficiency estrogen synthesis, that also can activate IFN gamma, but with decreasing in IFN-beta, and alpha that can lead to increasing in “catabolic processes” with decreasing in the RORs pathways “anabolic pathway”, and decreasing in proper PLC γ 2 productions that will reflect Ca⁺ precipitations and arterial hypertension [7].

Where, it has been reported that insulin activates the K-ATP channels of pancreatic β -cells and islets, resulting in membrane hyperpolarization, and the abolition of [Ca²⁺]_i oscillations [8].

And, the low abolition of [Ca²⁺]_i oscillations in the case of T2DM indicates decreasing or inhibition in pyrimidine synthesis “which regulated by synthetase”, also indicate decreasing in synthase functions, and consequently indicate decreasing in PLC γ 2 synthesis “that has the role of modulating inositol 1,4,5-trisphosphate-mediated calcium oscillations for bone growth”.

Also, decreasing in membrane hyperpolarization can give reflection of decreasing in OPA1 synthase oxidations which reflect decreasing in membrane hyperpolarization due to decreasing in fatty-Acyl-COA-beta production “which regulated by synthase effect for ROR-beta synthesis pathway” and consequently reflects decreasing in PLC γ 2 synthesis and activities.

(PLC γ 1) can be reactivated by platelet-derived growth factor “GF” receptors, insulin-like GF 1 receptor, but in brief PLC γ 1 productions can produced and re-functioned by several active growth factor (GF) receptors through their feedback and by firstly stimulate synthetase for gamma subunits (fatty Acyl-COA-gamma) synthesis followed by synthase for beta-subunits productions, then followed by phospholipase effects for alpha-subunits production which can re-promote growth factor activities as epidermal GF receptor [EGFR], and platelet-derived GF receptor, where throughout primary activating the GFs processes the increasing in hyperpolarization will increase followed by functioning Ca⁺ throughout the synthesis of PLCs that will run the pathway of bone growth and immune modulations with promoting most of cellular activities.

The main PLC γ 1 proper activities is regulated firstly by proper S6K productions from mTOR Ser/Thr phosphorylation pathways followed by JAK STAT signaling for producing the Tyr-phosphatase, gamma common receptors, and other necessary helical proteins receptors which adopt and reactivate both PLC γ 1&2 synthesis and activities for adopting anti-inflammatory processes, for adopting B-cells maturation, for T-cells modulation, and for bone growth with proper cellular proliferation.

PLC γ 1 is a necessary Protein that is designed for promoting PLC γ 2 and IFN-beta which are necessary for adopting immune efficiencies and for promoting B-cells maturation, bone growth T-cells modulations... etc, that PLC γ 1 firstly is designed by chromosomes that will transfer their necessary codons for creating their own necessary isoforms. The necessary Condon from chromosome will translate their orders to ribosome which will send it to mTOR Ser/Thr phosphorylations signalling for S6K synthesis which then will be used for ATPase synthesis and for proper OPA1 repair for reactivating OPA1 enzymes which are so necessary for regulating RORS isoforms Biosynthesis where RORs synthesis Pathways are the main for productions of gamma subunits which can be considered as PLC γ 1 and IFN-Gamma, where both PLC γ 1 and IFN-gamma are reactivating each other and then are and can regulate PLC γ 2 productions “upon BTK functions” which can renew Tyr phosphorylation and phosphatase functions, where JAK signaling are mediated PLC γ 1 upregulated phosphorylation for creating and activating necessary receptors for active PLC γ 2 synthesis which promote immune modulations, cellular proliferation, and bones growth including thromboxane-A₂ synthesis for renewing blood cells.

Hydrophobic acids such as Tyrosine, Ser, proline are necessary for facilitate the OPA1 oxidative process (specifically Proline amino acids) and cellular activities including B-cells maturation and survival that can protect proliferations processes of bones developments (also can activate tumor growth in case of synthase or OPA1 dysfunction when lose or deprived of some necessary amino acids). where, proline is so necessary for activating OPA1 enzymes functions which activate bone cartilage growth, and activate BTK pathway which necessary for FGFR2 gene expression for bones developments.

Tyrosine amino acids increase alertness and bone development through activating tyrosine kinases and PLC γ 2 productions, that Tyrosine phosphatases which are potential therapeutic targets for fighting bone disorders [9].

Protein tyrosine phosphatase (PTP) gamma (carry-ve charge regulated firstly by synthetase (gamma-oxidations) has been proposed to be an important regulator of chondrogenic patterning, where PTPs are critical regulators “and renewer” of tyrosine phosphorylation at multiple stages of bone development and metabolism [10].

And, proline-rich tyrosine kinases regulate osteoprogenitor cells and bone formations, so Tyrosine and Proline are regulating PIPs which are critical regulators for multiple stages in bone development started by cartilage synthesis [11].

Tyrosine, Ser and proline are essential hydrophobic acids that produced in vivo upon the effects of synthetase enzymes throughout nutrients-mTOR, and throughout synthetase effects on inflammations molecules for running pyrimidine synthesis for amino acids synthesis then for creating and improving (modulating) active Gamma-subunits for PLC γ 1 synthesis through RORs pathway functions which modulate and regulate both PLC γ 1 (active gamma subunits) and PLC γ 2 (active beta subunits) synthesis “upon BTK regulation” for modulating immune activity for increasing anti-inflammatory efficiency, then for modulating proliferation through more phospholipase upregulation for producing “PLC-alpha” more active alpha subunits which necessary for MHC class 2, for SIRP α 1, for TLR4 synthesis.

PLCs can recover IFNs synthesis and vice versa but each isoform can recover its own related isoform which can begins from either interferons or from PLCs) for running main necessary pathway for PLC γ 2 synthesis for B-cells maturation, for T-cells modulation, for bone growth, and for TXA2 synthesis.

So, PLC γ 2 can be promoted also by IFN beta for reactivating B-cell receptors for promoting antigens IgM and IgD biosynthesis, and also PLC γ 2 can promote IFN-beta for MHC class-2 which promote the SIRP α 1, TLR4, and PD-L1 productions respectively necessary for bone growth, cells developments and T-cells modulations.

PLC γ 1 competes for a binding site at C terminus of fibroblast growth factor receptor (FGFR2) (which plays an important role in bone growth, particularly during “embryonic development”) and is sufficient to upregulate phospholipase activity. Indicated to me that RORs Biosynthesis pathway are also so necessary for reactivating both PLCs isoforms and IFNs isoforms which are so necessary for PLC γ 2 synthesis for B-cells maturation, for increasing immunity effectiveness, and for bone growth with cellular proliferation, where as I mentioned previously that both IFNs and PLCs can reactivate each other in critical situations [12]. Proper S6K and OPA1 enzymes are regulating RORs Biosynthesis pathways which regulate both PLC γ 1 and IFN gamma productions, that PLC γ 1 will regulate the PLC γ 2 synthesis through BTK and OPA1-synthase functions for active beta-subunits (“PLC γ 2”) productions which can stimulate the upregulation of more phospholipase “activity” for active alpha subunits (PLC-alpha) productions which can reactivate the production of fibroblast growth factor and their receptors (FGFR2) for proliferations, for bone growth, for TXA2 synthesis, and for T-cells modulations. There are strong relationships between PLC γ 1&2 bio-function

for the MHC class 1 and MHC class 2 which promote SIRP α 1, TLR4, and PDL1 productions for proliferation, and for blood cells modulation and recoveries.

Only Synthetase enzyme in OPA1 mitochondrial membrane are having the function of hydrolysis biological molecules, inflammations and phospholipid membranes in vivo for producing active gamma-subunits, but normally followed by the effects of the 2nd enzyme in OPA1 which is synthase for activating beta-subunits for producing PLC γ 2 which will stimulate more phospholipase effects for PLC alpha production, but in case of deficiency in the synthase activities or in presence of mutated S6K the Osteoclast will be activated which defined as more analyzing of biological molecules with decreasing in anabolic processes “osteoblast”, but Osteoblast activity is characterized by proper availabilities of S6K, synthase activities, and PLC γ 2 synthesis with proper IFN-beta synthesis for increasing immune effectiveness and for promoting PLC-alpha which promote proliferation and bone growth including TXA2 Biosynthesis.

Where, Interferon beta 2/B-cell stimulatory factor type 2 shares identity with monocyte-derived hepatocyte-stimulating factor and regulates the major acute phase protein response in liver cells PLCs isoforms synthesis that are involved in multiple stages in TLR4 and interferons regulatory factors (IRFs) synthesis [13,14]. Where it indicate that PLCs can recover IFNs (and vice versa) for IFN-gamma productions which promote MHC class 1 and MHC class-2 which promote SIRP α 1 synthesis and TLR4 for proliferation and bone growth, so the involvement of PLC γ 2 in TLR4 synthesis can be started by promoting IFN-beta productions for modulate anti-inflammatory processes followed by proliferation processes, and also PLC γ 1 can promote IFN gamma activities (PLC γ 1 \leftrightarrow IFN gamma) which responsible for promoting MHCs class-1 and class two (upon synthase effects) then for SIRP α 1, TLR4 and PDL1 productions for proliferation, bone growth and T-cells modulations (upon phospholipase effects).

So, proper PLC γ 1 can be considered as important regulator produced in vivo for activating IFN-gamma (and vice versa) for regulating to both PLC γ 2 and IFN-beta upon BTK activity for adopting anti-inflammatory processes which will be upgraded and moderated by more phospholipase activities for PLC-alpha, SIRP α 1 TLR4 and and for PD-L1 productions.

Therefore, PLC γ 1 can regulate both IFN-beta and PLC γ 2 productions, and IFN-Gamma can regulate both Plc γ 2 and IFN-beta production too, where both PLC γ 1 and IFN-Gamma are Regulated mainly by proper S6K synthesis, but PLC γ 2 and IFN-beta are promoted by BTK pathways (through PLC γ 1 and IFN-Gamma regulations). That also PLC γ 1 and IFN-Gamma are regulated by tyrosine phosphatase receptors productions and by phospho-tyrosine receptors “PTyr-R” For activating PLC γ 2 productions which then regulate PLC-alpha reproduction for bone growth, for B cells maturation, for T-cells modulations, and for cellular proliferation.

PLC γ 2 can be considered also as basically depending on JAK signaling for promoting SH2B adaptor protein “which are a Tyr kinase receptor family” which are necessary for BCR mediate B cells maturations. The phospho-tyrosine “PTyr” are necessary for PLCs isoforms synthesis, and for SHP1Src homology region 2 domain-containing phosphatase 1 for regulating PLCs productions, for stimulating IFNs productions, for adopting anti-inflammatory processes, and for proliferations, B-cells maturation, and T-cells modulations [15].

PLC γ 1 is associated with numerous inflammatory diseases due to deficiency or inhibition in synthase that may due to inhibition in S6K, or in some necessary amino acids that necessary for activating synthase as Proline which considered as so necessary for amino acids synthesis through its importance for ornithine synthesis (upon aminotransferase effect), so Proline is so imp amino acids not only for amino acids synthesis but also for promoting RORs synthesis Pathways and their necessary fatty Acyl-COAs synthesis which regulated by proper OPA1 activities which in themselves depending on Proline activities, that proper synthase functions promote PLC γ 2 productions “upon BTK regulations”. In sever serious diseases its main reason to be caused are the deficiency in hydrophobic acids specifically the deficiency in Ser, Proline, Tyrosine, Leu... amino acids, that the intracellular activity will depend only on COX, mutated ATPase and on PLC γ 1 with IFN-Gamma activity with absence or decreasing in PLC γ 2 and in IFN-beta, that can be the result of osteoclast process and can be the result of TXA2 inhibition (which regulated by PLC γ 2).

PLC γ 1 recruit to Colony-stimulating factor-1 “CSF-1” and followed by synthase regulation for producing PLC γ 2 necessary for reactivating anti-inflammatory processing by IFN-beta productions which re-activate PLC- γ 2 via tyrosine kinase upstream.

The PLC γ 1 has the specificity toward colony-stimulating factor receptor synthesis (CSF-1) signaling which produced on the cell surface that can help cells to proliferate and differentiate into specific blood cells which can considered as a class III receptor tyrosine kinase that associated with Neuroinflammation, where PLC γ 1 is recruited to the CSF-1 receptor following exposure to the cytokine. PLC γ 1 has a function for recruit to CSF-1 which necessary for promoting PLC γ 2 synthesis and IFN- β synthesis for re-activating anti-inflammatory and then followed promoting proliferation through activating both IFN-alpha and PLC-alpha, SIRP α 1, TLR4 and then PD-L1 productions.

CSF-1 is a members of the IL-1 receptor family regulated by Gamma oxidation (synthetase effects) for stimulating PLC γ 1 synthesis for promoting PLC γ 2 production and for prompting IFN-beta productions for modulating anti-inflammatory efficiency. It has been reported that CSF1R-expressing cells may play an anti-inflammatory role or a cancer-suppressive role [16], that as PLC γ 1 recruiting to CSF-1 for regulating PLC γ 2 synthesis as CSF-1 play necessary role in anti-inflammatory processes which regulated firstly by mitochondrial OPA1 and by proper S6K production, and by PLC γ 1 synthesis.

Also, Tripartite motif (TRIM) 22 plays an important role in interferons (IFNs)-mediated antiviral activity and the Induction of TRIM22 by IFN- γ Involves JAK and PC-PLC/PKC [17].

So, PLCs synthesis modulate and regulate Tripartite motif (TRIM) 22 too (which has antimicrobial activities) productions through activating IFNs production.

Also, IFN- γ activates PLC- γ 2 via an upstream tyrosine kinase to induce activation of PKC- α [18]. That PLC γ 2 regulated by PLC γ 1 which can promote IFN-gamma production (through feedback) which has a variety of activities including PLC γ 2 re-productions upon the necessity regulations of the upstream of tyrosine kinases for re-activating PKC- α .

PLC γ 1 recruited to CSF-1 for two pathways activities 1st / reactivating IFNs productions which regulate MHC class1 and

class two for modulating cell-surface protein activities, 2nd / activating PLC γ 2 for modulating T-cells, where PLC γ 1 Involved in the production of TRIM22 for mediating antiviral activities and antiinflammatory processes through reactivating IFNs productions for PLC γ 2 synthesis which modulate T-cells and activate bone growth with activating necessary proliferation. And also PLC γ 1 promote IFN gamma that regulate MHC-class-I, MHC class-2 synthesis which promote, SIRP α 1, TLR4, and PD-L1 synthesis. Note that the inhibitions of PLC γ 2 productions with PLC γ 1 productions will lead to Osteoclast, but the proper balance of both PLC γ 1 and PLC γ 2 productions will lead to osteoblast where PLC γ 2 are connected to IFNs productions too. Also, the Colony-stimulating factor-1 “CSF-1” requires PI3-kinasemediated metabolism for proliferation [19].

PLC γ 1 recruited to Colonystimulating Factor 1 “CSF-1” Depending on mTOR-Ser /Thr phosphorylation for p13k and for proper S6K productions, where CSF-1 will be suppressed by IFN-beta synthesis and also by PLC γ 2 synthesis (regulated by synthase) for modulating antiinflammatory processes and for upregulation of phospholipase activities for proliferation processes and for bone growth including TXA2 synthesis.

Where, the inhibitions of of fatty acid synthase “FAS” activity by C75 Is resulted in down regulation of phospho-AKT. [20]

The inhibition in synthase will reflect increasing in CSF-1 and down regulations in PLC γ 2 and IFN-beta followed by decreasing in IFN-alpha and in PLCalpha production lead to decreasing in cellular proliferation and in TXA2 synthesis.

PLC γ 2 synthesis activate Osteoblast but PLC γ 1 production with inhibition in PLC γ 2 will activate Osteoclast (OC) by inhibiting the inositol 1,4,5-trisphosphate-

PLC γ 1&2 synthesis are re-modulating variety of cellular pathways including IFNs isoforms and osteoclast (OC) differentiation. Where, PLC γ 2 productions is important to be in proper balance with PLC γ 1 synthesis for running osteoblast and for inhibiting osteoclast, where the increasing in PLC γ 1 productions with inhibition or decreasing in PLC γ 2 synthesis will activate osteoclast (OC) by inhibiting or decreasing in re-modulating inositol 1,4,5-trisphosphate “which mediated calcium oscillations and the up-regulation of the nuclear transcription factor NFATc1”. [21] That, inositol 1,4,5-trisphosphate and diacylglycerol productions require phosphoinositide synthase (PIS) for modulating OC differentiation through regulating transient receptor potential (TRP) channels which requires hydrolysis of phosphatidylinositol 4,5-bisphosphate (PIP) Resulting in the generation of inositol 1,4,5-trisphosphate (IP3) and diacylglycerol (DAG).

OPA1 synthase is necessary for creating sphosphoinositide synthase (PIS) which will regulate PLC γ 2 synthesis for upregulate phospholipase activity for PLC alpha production for proliferations and bone growth, Where, increasing in PLC γ 1 “with reduction or inhibitions in PLC γ 2 productions will activate osteoclast but the reactivating proper PLC γ 2 synthesis will activate Osteoblast. PLC γ 2, independent of PLC γ 1, was required for receptor activator of NF- κ B ligand-induced osteoclastogenesis by differentially regulating nuclear factor of activated T cells c1 (NFATc1) [22], proper PLC γ 2 Pathway for modulating osteoclastogenesis Processes mediated by synthase effect for modulating T-cells for adopting anti-inflammations and cellular protection followed by upregulation of phospholipase functions for cellular proliferation,

bones growth and TXA₂ synthesis.

BTK regulate PLC γ 2 which regulate both BCR and Thromboxane-A₂ synthesis, where, CLL disease due to full inhibition in PLC γ 2. Phospholipase C γ 2 is Critical for Dectin-1 mediated Ca²⁺ Flux and Cytokine Production in Dendritic Cells [23].

PLC γ 2 has a critical activity in dendritic cells, where is having a Critical function for Development of a Murine Model of Inflammatory Arthritis [24].

And, as PLC γ 2 has a critical activity in dendritic cells for activating NF- κ B ligand-induced osteoclastogenesis By differentially regulating nuclear factor-activated T cells c1 “NFATc1” As PLC γ 2 production modulate first the capacity of T-cells of dendritic cells. PLC γ 2 is critical for B-cell receptor (BCR) for B cells maturation and functions, and PLC γ 2 participates in TCR signal transduction and plays a role in T-cell selection [25].

It has been reported that Properdin and factor H production by human dendritic cells modulates their T-cell stimulatory [26].

Properdin is plasma glycoprotein that when activated by PLC γ 1 (and synthetase) that will be modulated by changing the unnecessary purines to pyrimidines for rebuilding necessary Tyr, Ser, Pro, then will be directed to x chromosome for translations and purification for being build by identical necessary sequences for being contain identical six thrombospondin that will be ready to be regulated and modulated by PLC γ 2 for TXA₂ synthesis and for modulating T-cells which mediate cellular and bone growth. The increasing in PLC γ 1 productions with deficiency or mutation in S6K and thus in Properdin will inhibit PLC γ 2 functions and will reflect decreasing in B cells maturation with decreasing or mutations in the thrombospondin lead to inhibition in TXA₂ synthesis and can lead to Autoinflammation and immune dysregulation (APLAID) which can cause rare monogenic autoinflammatory disease. That, the diverse pathologies associated with PLC γ 2 are exemplified by distinct genetic variants, where inherited mutations at this locus cause PLC γ 2-associated antibody deficiency and immune dysregulation [27].

Thrombine activation is highly reactivate intermediate the true fibrin monomer and it rapidly, and irreversibly [28].

That Thrombine is activated by PLC γ 2 which intermediate fibrin monomer. Where, PLC γ 2 involved with fibrin formation, where Bruton tyrosine kinase (Btk) activates PLC γ 2, 11,12 leading to thromboxane A₂ (TXA₂) synthesis. So, proper PLC γ 2 synthesis depend on PLC γ 1 and on BTK activities where both are necessary for regulating PLC γ 2 for regulating thromboxane-A₂ and fibrin for re-modulating immune and T cells activities [29].

Also, the anti-platelets and anti thrombotic effects of Fc are carried out through oppression of PLC γ 2 and subsequent DAG-PKCTXA₂ and IP₃-[Ca²⁺] [30].

The activation of PLC β through Gq, which results in the formation of IP₃ and diacyl glycerol, plays an important role in mediating α Ib β 3 activation [31, 32].

So in brief the proper S6K, PLC γ 1, and BTK necessary for regulating PLC γ 2 productions which is necessary for B-cell maturation and T-cells modulations, and necessary for regulating thromboxane-A synthesis.

Chronic lymphocytic leukemia [CLL] reflect Inhibition in BTK and in PLC γ 2 synthesis which reflect Inhibition or impair in Thromboxane-A:

Proline amino acids are required for Collagen synthesis [33] where, Collagen binds to its receptors and activate both the PLC γ 2-DAG-PKC and PI3 kinase/Akt-p38 MAPK cascades, where p38 MAPK can activate cPLA₂, which catalyzes arachidonic acid (AA) release to produce thromboxane A₂ (TxA₂) formation [34].

Bruton’s tyrosine kinase “BTK” activates PLC γ 2 variants mediating ibrutinib resistance in human CLL [35].

BTK inhibitors [ibrutinib, CNX-774] significantly attenuated TPA-induced cell invasion and migration in MCF-7 cells and inhibit the activation of the phospholipase C γ 2/PKC β signaling pathways [36].

BTK was initially shown to be defective in the primary immunodeficiency X-linked a gamma-globulinemia (XLA) and is essential both for B cell development and function of mature [37].

So, both of Collagen synthesis and BTK are the main functions for re-activating PLC γ 2 which catalyzes arachidonic acid (AA) release to produce thromboxane-A₂ (TXA₂) formation (note the inhibition or mutation in BTK and PLC γ 2 will inhibit TXA₂ synthesis and will cause Chronic lymphocytic leukemia), where both BTK and PLC γ 2 are so necessary for B cells maturation and are critical for B-cell receptor (BCR), where, inhibition or reduction in BTK and in PLC γ 2 will reflect Inhibition in B-cells maturation, inhibition in T-cells modulations, and inhibitions in TXA₂ synthesis and will be the result of Chronic lymphocytic leukemia “CLL” disease.

Vascular endothelial growth factor receptor (VEGFR) but not KIT, platelet-derived growth factor receptor (PDGFR) and FMS-like tyrosine kinase 3 (FLT3) are critical for CLL cell viability [38].

MTOR Ser/Thr phosphorylation pathway regulate S6K production and promote VEGF activities for reproducing TXA₂ (but through PLC γ 2 regulations) in one pathway, and the other pathway is stimulating the PLC γ 1 productions and promoting BTK activities for activating PLC γ 2 productions which will reactivate the proper TXA₂ synthesis and mediate the activities of VEGF for producing TXA₂, for reactivating tropomyocin, and reactivating G-actin filaments activities.

My note is, the synthesis of proper TXA₂ in vivo are fully depending on PLC γ 2 and consequently on S6K and BTK activities and functions, but only VEGF are not enough and not satisfied for TXA₂ synthesis.

The proper S6K synthesis which will reactivate the PLC γ 1 and DTK which will promote the PLC γ 2 synthesis which I can consider it as the main necessary proper tools for TXA₂ synthesis for blood synthesis, for bones maturations and for cells growth and then CLL cell viability.

So, PLC γ 2 (which basically regulated by ribosomes, by S6K, and by PLC γ 1) promote TXA₂ synthesis which can stimulate and reactivate VEGF synthesis upon feedback for tropomyocin and for G-actin filaments reactivations for running full cellular Biosynthesis, for blood filtering in veins, and for cellular metabolism.

Chronic lymphocytic leukaemia (CLL) is a malignancy of CD5+ B cells that is characterized by the accumulation of small, mature-appearing lymphocytes in the blood, in bone marrow and in lymphoid tissues due to PLC γ 2 inhibition may due to full mutated S6K production.

PLC γ 2 synthesis occurred mainly in bone marrow where normal blood synthesis is regulated by skeletal tissue that is having orders from basic ribosomes, but mature CLL blood are activated and formed only by the activities of mTOR Ser/ Thr signaling which promote the VEGF, tropomyocin synthesis (where both cannot promote TXA2 synthesis without PLC γ 2 availability) that both VEGF and tropomyocin are necessary for reactivate G-actin filaments and re purify blood in veins.

So why VEGF + Tropomyocine is producing white mature cells?? VEGF can not regulate directly the PLC γ 2 synthesis and consequently can't regulate TXA2 synthesis but TXA2 synthesis can not be done without PLC γ 2 regulations.

Where VEGF responsible for increasing the plasma long lived-plasma cells (LLPC), then the generation of antigen-specific antibody for

Durable humoral immunity (which produced by non-proliferating bone marrow [39].

Old blood cells when passes through spleen will be broken to save iron which bind to PLC γ 2 for regenerate new blood cells by PLC γ 2 which extracted in spleen which are responsible for metals transportations and proliferation for new cells, but inhibition in PLC γ 2 with increasing in the mutated S6K will inhibit TXA2 synthesis and will increase long lived plasma which increased by increasing in nutrients-mTOR signalling.

The B cell receptor (BCR) signaling pathway (which regulated by PLC γ 2 synthesis and activities) has critical cell survival implications in B-cells malignancies, such as chronic lymphocytic leukemia (CLL). Small molecule tyrosine kinase inhibitors of members of the BCR signaling pathway have proven to be transformational in treatment of CLL [40].

The B-cell receptor (BCR) is a key survival molecule for normal B cells and for most B-cell malignancies.

In CLL, engagement of the BCR (which regulated by PLC γ 2) by antigen occurs in vivo, leading to down-regulated expression and to an unanticipated modulation of glycosylation of surface IgM, [41].

So inhibition in PLC γ 2 synthesis will inhibit BCR signalling function that will lead to inhibition in modulation in IgM which normally done by BCR function for activating B-cells maturation.

The anti-apoptotic cell IgM natural antibodies can regulate inflammatory responses through ancient pathways of the innate immune system that first arose long before the initial emergence of the adaptive immune system [42].

My note,

PLC γ 2 first regulate BCR activities which regulate both of IgM & IgD synthesis through synthase enzyme regulations, where IgM is more active and less stable than IgD, that IgM necessary for modulating and regulating inflammatory immune response

and anti-inflammatory processes through modulating T-cells reactivities.

Results and Conclusion

Chronic lymphocytic leukemia [CLL] due to Inhibition in PLC γ 2 synthesis "due to inhibition in OPA1 synthase" lead to inhibition in CXCR12 where CXCR12 is the main activator and regulator for CXCR4 synthesis Upton phospholipase effects on CXCR12.

Also inhibition in PLC γ 2 Bio-Synthesis will reflect Inhibition in thromboxane-A2 production that TXA2 mainly regulated by PLC γ 2 but not regulated by VEGF, where VEGF regulate white mature cells, and regulate Tropomyocin Activity.

Osteoarthritis "OA" is characterized by a sharp expression in Gamma-Phospholipase C-1 "PLC γ 1" (which catabolize inflammations), with decreasing "or inhibition" in PLC γ 2 "PLC beta" productions (which necessary for immune modulation, for B-cell maturation and for T-cells modulation and regulate TXA2 synthesis).

The increasing in PLC γ 1 with Deficiency in Ser amino acids, and deficiency in proper S6K, with decreasing or inhibition in OPA1 synthase activity will lead to inhibition in PLC γ 2 which lead to diabetes and early Osteoarthritis "OA" prognosis. PLC γ 2 are so necessary for re-modulating T-cells and immune efficiencies, and necessary for regulating antigen and thromboxane-A synthesis. The inhibitions or reduction or mutations in BTK and in its main proper PLC γ 2 productions will cause an inherent inhibition or reduction in CXCL12 then will be followed by inhibition or reduction in CXCR4 then will lead to inhibition in the regulation of B-cell maturation, migration, adhesion, and also lead to severe decreasing in anti-inflammatory processes of immune productive efficiency.

Also inhibition in BTK and PLC γ 2 mainly will reflect Inhibition in the two antigens IgM in and IgD synthesis. Inhibition in synthase will reflect increasing in CSF-1 and down regulations in PLC γ 2 and IFN-beta followed by decreasing in IFN-alpha and in PLC α production lead to decreasing in cellular proliferation and in TXA2 synthesis.

Chronic lymphocytic leukemia "CLL" reflect decreasing or inhibition in growth-promoting signaling via the B-cell receptor. The Bruton tyrosine kinase (BTK) is the important for PLC γ 2 synthesis which is necessary for B-cell maturations, T-cells modulation, and TXA2 synthesis.

Bruton tyrosine kinase (Btk) necessary for activating PLC γ , 11, 12 which necessary to activating thromboxane A2 synthesis, and necessary for modulating immune activities and T-cells.

Both Collagen and BTK pathways are necessary tools for reactivating PLC γ 2 which catalyzes arachidonic acid (AA) release to produce thromboxane-A2 (TXA2) synthesis, and necessary for B cells maturation and critical for B-cell receptor (BCR), where, inhibition in BTK and in PLC γ 2 will reflect diabetes, Osteoarthritis, and the Chronic lymphocytic leukemia "CLL" disease depending on the percentage of Ser & hydroponic amino acids shortage and depending on the percentage of inhibition of necessary pathways needed for PLC γ 2 synthesis and reactivities. Also, inhibition in the availability of Ser, Tyr, Leu, Pro will reflect dysfunction in BTK function and inhibition in PLC γ 2 synthesis that will lead to Osteosarcoma which is a cancer cases

that produces immature bone (due to mutins in PLCγ2 and in TLR4 productions) found at the end of long bones (the tissue that carry the function of PLCγ2 synthesis), often around the knee. The Deficiency in proline with inhibition in Ser, Tyr, leu (or mutations in synthase) will reflect Inhibition in synthase functions that will inhibit beta-subunits PLCγ2 synthesis and will lead to inhibition in TXA2 synthesis, that can reflect Inhibition in two or more of Interferon isoforms but will sure will reflect Inhibition in IFN-beta synthesis which promoted by synthase functions and by PLCγ2, that will reflect also decreasing or inhibition in MHC class-2 (which regulated by synthase and IFN-beta) that will lead to deficiency or inhibition in "SIRPα1, in TLR4, and in PD-L1 synthesis lead to isolations to that tissue part (due to calcium precipitation) that can lead to mutated immature bone synthesis and decreasing or inhibition in TXA2 synthesis.

Conflict of Interest Statement

The Author declare that the research work has been conducted in the absence of any commercial or financial relationships, that could be construed as a potential conflict of interest.

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